

# **SQMS Quantum for Science - March 2024 (London)**

## **Report of Contributions**

Contribution ID: 1

Type: **not specified**

## **Dark matter landscape motivating new ideas in quantum sensors (theory intro)**

*Friday, 22 March 2024 09:30 (20 minutes)*

**Presenters:** HARNIK, Roni (Fermilab); HARNIK, Roni (Fermilab)

**Session Classification:** Morning session

Contribution ID: 2

Type: **not specified**

## Fermilab - Matt Hollister

*Wednesday, 20 March 2024 13:30 (30 minutes)*

**Presenter:** HOLLISTER, Matt

**Session Classification:** Day 1, session 2

Contribution ID: 3

Type: **not specified**

## Gran Sasso INFN

*Wednesday, 20 March 2024 14:00 (30 minutes)*

**Presenter:** PIRRO, Stefano (INFN - Laboratori Nazionali del Gran Sasso, Italy)

**Session Classification:** Day 1, session 2

Contribution ID: 4

Type: **not specified**

## SnoLab, Andrew Kubik

*Wednesday, 20 March 2024 14:30 (20 minutes)*

**Session Classification:** Day 1, session 2

Contribution ID: 5

Type: **not specified**

## Boulby

*Wednesday, 20 March 2024 15:20 (20 minutes)*

**Presenter:** SCOVELL, Paul (STFC)

**Session Classification:** Day 1, session 3: Underground / Low Temperature

Contribution ID: 6

Type: **not specified**

**INFN**

*Wednesday, 20 March 2024 15:40 (20 minutes)*

**Presenter:** CARDANI, Laura

**Session Classification:** Day 1, session 3: Underground / Low Temperature

Contribution ID: 7

Type: **not specified**

## Jon Prance - Isolab

*Wednesday, 20 March 2024 16:00 (20 minutes)*

**Presenter:** PRANCE, Jonathan

**Session Classification:** Day 1, session 3: Underground / Low Temperature



Contribution ID: 8

Type: **not specified**

## Jan Nyeki- Cryofree Demag

*Wednesday, 20 March 2024 16:20 (20 minutes)*

**Session Classification:** Day 1, session 3: Underground / Low Temperature

Contribution ID: 9

Type: **not specified**

## Nexus Enectali Figueroa

**Session Classification:** Day 1, session 3: Underground / Low Temperature

Contribution ID: **10**

Type: **not specified**

## Panagiotis Spentzouris

**Session Classification:** Day 1, session 3: Underground / Low Temperature

Contribution ID: **11**

Type: **not specified**

## **Quantum technologies for fundamental physics (experiment intro)**

*Friday, 22 March 2024 11:20 (20 minutes)*

**Presenter:** SHIPSEY, Ian (University of Oxford (GB))

**Session Classification:** Morning session

Contribution ID: 12

Type: **not specified**

## **New ideas for testing particle dark matter and phase transitions in He-3**

*Friday, 22 March 2024 11:40 (20 minutes)*

**Presenter:** CASEY, Andrew

**Session Classification:** Morning session

Contribution ID: 13

Type: **not specified**

## **New ideas for axion searches in superfluid helium**

*Friday, 22 March 2024 12:00 (20 minutes)*

**Presenter:** FOSTER, Joshua

**Session Classification:** Morning session

Contribution ID: 14

Type: **not specified**

## **DM and GW searchers with Atom Interferometers**

**Presenter:** BUCHMULLER, Oliver (Imperial College (GB))

**Session Classification:** Day 3 session 3

Contribution ID: 15

Type: **not specified**

## **New ideas for low-frequency gravitational wave detection with quantum sensors**

*Friday, 22 March 2024 15:00 (20 minutes)*

**Presenter:** KOVACHY, Tim

**Session Classification:** Day 3 session 3



Contribution ID: 16

Type: **not specified**

## Quantum sensor needs for dark matter axion searches

*Friday, 22 March 2024 12:20 (20 minutes)*

**Presenter:** CHOU, Aaron

**Session Classification:** Morning session

Contribution ID: 17

Type: **not specified**

## **Cavity based searches for new particles and gravitational waves**

*Friday, 22 March 2024 15:20 (20 minutes)*

**Presenter:** GIACCONE, Bianca (Fermi National Accelerator Laboratory)

**Session Classification:** Day 3 session 3

Contribution ID: **18**

Type: **not specified**

## **SERAPH: Dark Matter using SRF cavities and Superconducting Qubits**

*Friday, 22 March 2024 16:20 (20 minutes)*

**Presenter:** CERVANTES, Raphael

**Session Classification:** Day 3: session 4

Contribution ID: **19**

Type: **not specified**

# Quantum computers and their role in understanding fundamental physics

*Friday, 22 March 2024 09:50 (20 minutes)*

**Presenter:** DE JONG, Wibe

**Session Classification:** Morning session

Contribution ID: **20**

Type: **not specified**

## The 'Quantum Sensors for the Hidden Sector' project

*Friday, 22 March 2024 16:40 (20 minutes)*

**Presenter:** Prof. DAW, Ed (The University of Sheffield)

**Session Classification:** Day 3: session 4

Contribution ID: **21**

Type: **not specified**

# Quantum Simulators for Fundamental Physics

*Friday, 22 March 2024 10:10 (20 minutes)*

**Presenters:** WEINFURTNER, Silke; WEINFURTNER, Silke (The University of Nottingham)

**Session Classification:** Morning session

Contribution ID: 22

Type: **not specified**

## **New ideas for gravitational wave detection and axion searches (theory)**

*Friday, 22 March 2024 14:20 (20 minutes)*

**Presenters:** ELLIS, Sebastian (Universite de Geneve (CH)); ELLIS, Sebastian (SLAC National Accelerator Laboratory (US))

**Session Classification:** Day 3 session 3

Contribution ID: 23

Type: **not specified**

## **Microwave-Optical Transduction for Quantum Sensors and Sensor Networks**

*Friday, 22 March 2024 14:40 (20 minutes)*

**Presenters:** ZORZETTI, Silvia; Dr ZORZETTI, Silvia (Fermi National Accelerator Lab. (US))

**Session Classification:** Day 3 session 3



Contribution ID: 24

Type: **not specified**

## Understanding and eliminating materials sources of decoherence in superconducting qubits

*Thursday, 21 March 2024 09:30 (25 minutes)*

**Presenter:** MURTHY, Akshay (Fermilab)

**Session Classification:** Day 2, session 1

Contribution ID: 25

Type: **not specified**

# Tileable 3D-integrated superconducting circuits

*Thursday, 21 March 2024 09:55 (25 minutes)*

**Presenter:** LEEK, Peter (Oxford)

**Session Classification:** Day 2, session 1

Contribution ID: 26

Type: **not specified**

# Alternating-Bias Assisted Annealing of JJs for Transmons

*Thursday, 21 March 2024 10:20 (20 minutes)*

**Presenter:** PAPPAS, David (Rigetti)

**Session Classification:** Day 2, session 1

Contribution ID: 27

Type: **not specified**

## **Electron-beam annealing of Josephson junctions for frequency tuning of quantum processors**

*Thursday, 21 March 2024 10:40 (25 minutes)*

**Presenter:** SHELLY, Connor (Oxford Quantum Circuits)

**Session Classification:** Day 2, session 1

Contribution ID: 28

Type: **not specified**

## Quasiparticles vs TLS

*Thursday, 21 March 2024 11:35 (25 minutes)*

**Presenter:** FAORO, Lara (Google)

**Session Classification:** Day 2, session 2

Contribution ID: 29

Type: **not specified**

# **Quasiparticle dynamics in on-chip superconducting microwave resonator arrays at single photon regime for hybrid quantum circuits**

*Thursday, 21 March 2024 12:25 (25 minutes)*

**Presenter:** DELFANAZARI, Kaveh (University of Glasgow)

**Session Classification:** Day 2, session 2

Contribution ID: 30

Type: **not specified**

# Investigating Electronic Properties of Materials for Superconducting Qubits through Scanning Tunneling Microscopy and Spectroscopy Studies

*Thursday, 21 March 2024 14:10 (25 minutes)*

**Presenter:** IAVARONE, Maria (Temple University)

**Session Classification:** Day 2, session 3

Contribution ID: 31

Type: **not specified**

## **Imaging single TLS defects in live quantum circuits using scanning gate microscopy**

*Thursday, 21 March 2024 14:35 (25 minutes)*

**Presenter:** BANERJEE, Riju (National Physical Laboratory)

**Session Classification:** Day 2, session 3



Contribution ID: 32

Type: **not specified**

## **Cooling, noise mitigation, and decoherence in quantum circuits immersed in a quantum fluid bath**

*Thursday, 21 March 2024 15:00 (25 minutes)*

**Presenter:** SAUNDERS, John (Royal Holloway, University of London)

**Session Classification:** Day 2, session 3

Contribution ID: 33

Type: **not specified**

## **Simulating interactions between a qubit and a resonant two-level system bath**

*Thursday, 21 March 2024 15:45 (25 minutes)*

**Presenter:** ROSEN, Yaniv (Lawrence Livermore National Laboratory)

**Session Classification:** Day 2, session 4

Contribution ID: 34

Type: **not specified**

## Characterisation of a 3D aluminium cavity for the QSHS experiments

*Thursday, 21 March 2024 16:10 (25 minutes)*

**Presenter:** PASHKIN, Yuri (Lancaster University)

**Session Classification:** Day 2, session 4

Contribution ID: 35

Type: **not specified**

## Experience with TLS effect on the quality factor in 3D SRF Cavities

*Thursday, 21 March 2024 16:35 (25 minutes)*

**Presenter:** ROMANENKO, Alexander (Fermilab)

**Session Classification:** Day 2, session 4

Contribution ID: 36

Type: **not specified**

## **A theory for quasiparticle dissipation generated by embedded two-level tunneling atoms**

*Thursday, 21 March 2024 12:00 (25 minutes)*

**Presenter:** SAULS, James (LSU)

**Session Classification:** Day 2, session 2

Contribution ID: 37

Type: **not specified**

## STFC Quantum Landscape

*Wednesday, 20 March 2024 13:00 (15 minutes)*

**Presenter:** Prof. NEWBOLD, Dave (STFC Rutherford Appleton Laboratory (GB))

**Session Classification:** Day 1, Welcome Session

Contribution ID: **38**

Type: **not specified**

## **The DOE National Quantum Information Science Research Centers**

*Wednesday, 20 March 2024 13:15 (15 minutes)*

**Presenters:** GRASSELLINO, Anna; DE JONG, Wibe

**Session Classification:** Day 1, Welcome Session